

EXHIBIT 17

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

Samsung Electronics Co. Ltd. Case No. IPR2022-00996
Petitioner, Patent No. 11,016,918
vs.
Netlist, Inc., Case No. IPR2022-00999
Patent Owner. Patent No. 11,232,054

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VIDEOCONFERENCE DEPOSITION OF ANDREW WOLFE, Ph.D.

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Volume I (Pages 1 - 199)

Reported Remotely and Stenographically by:
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Job No. 5807753

<p>1 placed very close to a circuit, or in this case a 14:04</p> <p>2 chip, to provide a reservoir of electrical charge so 14:04</p> <p>3 that smaller peak currents can be pulled from the 14:04</p> <p>4 original power supply. If you don't have that, you 14:04</p> <p>5 can get voltage dips or other kinds of spikes in the 14:04</p> <p>6 voltage. 14:04</p> <p>7 Q. When --</p> <p>8 A. The larger the current you're using in a -- 14:04</p> <p>9 in a transient way, and the longer the distance 14:04</p> <p>10 between the power supply and the chip that's 14:04</p> <p>11 consuming the current, the greater the need for 14:05</p> <p>12 bypass capacitors. 14:05</p> <p>13 So by moving the power supply closer and 14:05</p> <p>14 having a unique power supply for each DIMM rather 14:05</p> <p>15 than a shared power supply for all the DIMMs, he can 14:05</p> <p>16 reduce the requirement for bypass capacitors. I 14:05</p> <p>17 believe holdup capacitors are essentially the same 14:05</p> <p>18 thing. 14:05</p> <p>19 Q. When you say bypass capacitors are 14:05</p> <p>20 capacitors that are placed very close to in this 14:05</p> <p>21 case a chip, which chip are you referring to? 14:05</p> <p>22 A. Probably every chip on the DIMM, but most 14:05</p> <p>23 importantly the DRAMs. 14:05</p> <p>24 Q. Okay. So you are referring to the chips on 14:05</p> <p>25 the DRAM, not to the, for example, the processes on 14:05</p> <p style="text-align: right;">Page 118</p>	<p>1 MR. CHANDLER: Object to form. 14:08</p> <p>2 THE WITNESS: One, Harris specifically tells 14:08</p> <p>3 the reader that he can use a modification of the FBD 14:08</p> <p>4 standard as part of his invention. 14:08</p> <p>5 But further than that, the FBD standard 14:08</p> <p>6 teaches how to use a buffer, it teaches details 14:08</p> <p>7 about what kinds of power supplies one might need 14:08</p> <p>8 for DRAM chips or for buffer chips or for 14:08</p> <p>9 termination, so there -- that Harris points to that 14:08</p> <p>10 standard. Harris mentions it as suitable, and then 14:09</p> <p>11 there's lots of useful information there to inform a 14:09</p> <p>12 person of ordinary skill who wants to design a DIMM. 14:09</p> <p>13 BY MS. ZHONG: 14:09</p> <p>14 Q. Would the design rules change if you changed 14:09</p> <p>15 the supply voltage for the FB-DIMM? 14:09</p> <p>16 A. By "design rules," you mean the thicknesses 14:09</p> <p>17 and spacing of conductors? 14:09</p> <p>18 Q. Among other things, yes. 14:09</p> <p>19 A. I'm not sure what "other things" you mean. 14:09</p> <p>20 You would have to tell me. 14:09</p> <p>21 Q. The trace placement, trace routing. 14:09</p> <p>22 A. Yeah, all of those things could change in 14:10</p> <p>23 ordinary ways. Every time you would make changes to 14:10</p> <p>24 a DIMM, there is a possibility that some of those 14:10</p> <p>25 things could change and those are ordinary 14:10</p> <p style="text-align: right;">Page 120</p>
<p>1 the motherboard? 14:05</p> <p>2 A. They would also have bypass capacitors, but 14:05</p> <p>3 their requirements would not change. It's only the 14:05</p> <p>4 ones that are being supplied local power in Harris' 14:05</p> <p>5 solution that would have a reduced need for bypass 14:06</p> <p>6 capacitors. 14:06</p> <p>7 Q. So on page 9 of Exhibit 1028, there is 14:06</p> <p>8 listed a number of supply voltages. 14:07</p> <p>9 Do you see that? 14:07</p> <p>10 A. I do. Four supply voltages. 14:07</p> <p>11 Q. And for standard FB-DIMMs, these are the 14:07</p> <p>12 voltages that are provided to the DIMM by the host; 14:07</p> <p>13 is that right? 14:07</p> <p>14 A. For FB-DIMMs compliant with JEDEC standard 14:07</p> <p>15 205, the voltages on page 9 are supplied from the 14:07</p> <p>16 host to the DIMM. 14:07</p> <p>17 Q. Okay. And in your combination of Harris and 14:07</p> <p>18 FB-DIMM, is the combined system compliant with the 14:07</p> <p>19 JEDEC standard? 14:07</p> <p>20 MR. CHANDLER: Object to form. 14:07</p> <p>21 THE WITNESS: No, probably not. 14:08</p> <p>22 BY MS. ZHONG: 14:08</p> <p>23 Q. So why would they be looking to the FB-DIMM 14:08</p> <p>24 standard if they are not going to create a 14:08</p> <p>25 JEDEC-compliant memory module? 14:08</p> <p style="text-align: right;">Page 119</p>	<p>1 engineering tasks to re-implement them. 14:10</p> <p>2 Q. Okay. So what are they looking for exactly? 14:10</p> <p>3 You said there are a lot of information in the 14:10</p> <p>4 FB-DIMM standard that we'd be looking to. What 14:10</p> <p>5 specifically are they looking for if all those 14:10</p> <p>6 things are going to change and it's within their 14:10</p> <p>7 skill set to know how to change them? 14:10</p> <p>8 A. Again, I cite a number of things throughout 14:10</p> <p>9 my report, throughout my declaration, so all of 14:10</p> <p>10 those things are relevant. But in particular, the 14:10</p> <p>11 specific voltages that one might want to use for a 14:10</p> <p>12 memory. 14:10</p> <p>13 Q. Uh-huh.</p> <p>14 A. And also the specific characteristics of an 14:10</p> <p>15 exemplary memory buffer. And the exemplary 14:11</p> <p>16 characteristics of specific exemplary DRAM chips. 14:11</p> <p>17 So those would be some of the things that 14:11</p> <p>18 would be most important that one might learn from 14:11</p> <p>19 the FB-DIMM standard, including the number of 14:11</p> <p>20 voltages that are useful to use in a DIMM. 14:11</p> <p>21 Q. What do you mean by "the number of 14:11</p> <p>22 voltages"? 14:11</p> <p>23 A. Well, we looked, for example, at the 14:11</p> <p>24 specification that showed that there were four 14:11</p> <p>25 important voltages on an FB-DIMM. So that would 14:11</p> <p style="text-align: right;">Page 121</p>

<p>1 inform one that if one were to generate voltages 14:12</p> <p>2 from a 12-volt supply as suggested by Harris, that 14:12</p> <p>3 one would want to generate perhaps 4 voltages. 14:12</p> <p>4 Q. Have you ever seen a host memory controller 14:12</p> <p>5 that is configured to provide 12 volts to a DIMM? 14:13</p> <p>6 A. No. It would be unusual for a host memory 14:13</p> <p>7 controller to supply the power to a DIMM. The power 14:13</p> <p>8 supply generally does that. 14:14</p> <p>9 Q. And have you ever seen a power supply that 14:14</p> <p>10 is configured to provide 12 volts to a DIMM at the 14:14</p> <p>11 time of the invention? 14:14</p> <p>12 A. Outside of Harris? 14:14</p> <p>13 Q. Correct. 14:14</p> <p>14 A. I don't recall seeing that outside of 14:15</p> <p>15 Harris. It doesn't mean that nobody did, but I 14:15</p> <p>16 don't recall seeing it. 14:15</p> <p>17 Q. And at the time of the invention, were you 14:15</p> <p>18 aware that -- aware of any computer power supply 14:15</p> <p>19 systems that is configured to provide 12 volts to a 14:15</p> <p>20 DIMM? 14:15</p> <p>21 A. I don't recall being aware of that, again, 14:15</p> <p>22 other than from the Harris reference. 14:15</p> <p>23 Q. So you were -- back in 2007, you were aware 14:15</p> <p>24 of Harris? 14:15</p> <p>25 A. No. No. 14:15</p> <p style="text-align: right;">Page 122</p>	<p>1 Q. So, basically, memory modules would refer to 14:17</p> <p>2 the RAM modules; correct? 14:17</p> <p>3 A. Again, it depends on context. But I think, 14:17</p> <p>4 most commonly, they would refer to -- or, you know, 14:17</p> <p>5 in that time frame, they would refer typically to 14:17</p> <p>6 ordinary memory DIMMs. You know, what's on the 14:17</p> <p>7 graphics card is a RAM module. 14:18</p> <p>8 Q. What is a "module" versus a "DRAM package"? 14:18</p> <p>9 A. A module is usually a collection of 14:18</p> <p>10 components. 14:18</p> <p>11 MR. CHANDLER: Objection to form. 14:18</p> <p>12 BY MS. ZHONG: 14:18</p> <p>13 Q. So a module usually refers to more than one 14:18</p> <p>14 DRAM package? 14:18</p> <p>15 MR. CHANDLER: Objection. Form. 14:18</p> <p>16 THE WITNESS: Again, so it's an ordinary 14:18</p> <p>17 word that depends on context. But usually in the 14:18</p> <p>18 electronics field, a module is a subassembly of 14:18</p> <p>19 components. 14:18</p> <p>20 BY MS. ZHONG: 14:18</p> <p>21 Q. What do you mean by "components"? 14:18</p> <p>22 MR. CHANDLER: Objection to form. 14:18</p> <p>23 THE WITNESS: Again, it depends on context. 14:18</p> <p>24 But a component in the most common usage probably in 14:19</p> <p>25 electronics is -- again, it does depend on context, 14:19</p> <p style="text-align: right;">Page 124</p>
<p>1 Q. Back in 2007, were you aware of any 14:15</p> <p>2 references similar to Harris -- or systems? 14:15</p> <p>3 A. There were definitely graphic cards at the 14:16</p> <p>4 time that used 12-volt power from the host to supply 14:16</p> <p>5 their on-board memory, their DRAM. But that -- 14:16</p> <p>6 those were not main memory DIMMs. 14:16</p> <p>7 Q. Okay. Would you call those graphic cards 14:16</p> <p>8 memory modules? 14:16</p> <p>9 A. They included memory modules, so they 14:16</p> <p>10 included both a graphics processor and a graphics 14:16</p> <p>11 memory. That graphics memory was accessible by the 14:16</p> <p>12 host computer, and it was powered by a separate 14:16</p> <p>13 12-volt power supply with a regulator on the board. 14:16</p> <p>14 Q. I asked you, do you consider those graphic 14:16</p> <p>15 cards memory modules? 14:16</p> <p>16 A. They were modules that contained memory. 14:16</p> <p>17 But when we use the term "memory modules," we 14:17</p> <p>18 typically were referring to main memory modules. It 14:17</p> <p>19 depends on the context. 14:17</p> <p>20 Q. When you say "main memory modules," what do 14:17</p> <p>21 you mean? 14:17</p> <p>22 A. Memory modules that are designed to connect 14:17</p> <p>23 to the primary memory controller for the purpose of 14:17</p> <p>24 holding general purpose code and data in a computer 14:17</p> <p>25 system. 14:17</p> <p style="text-align: right;">Page 123</p>	<p>1 but when we are talking about circuit boards, a 14:19</p> <p>2 component would be a single physical package that 14:19</p> <p>3 got mounted on the circuit board. 14:19</p> <p>4 BY MS. ZHONG: 14:19</p> <p>5 Q. Okay. So, basically, a module is usually an 14:19</p> <p>6 assembly of multiple components. 14:19</p> <p>7 MR. CHANDLER: Objection. Form. 14:19</p> <p>8 THE WITNESS: In an electronic circuit board 14:19</p> <p>9 context, that is the most common way that term is 14:19</p> <p>10 used. 14:19</p> <p>11 BY MS. ZHONG: 14:19</p> <p>12 Q. Okay. And you said that at the time of the 14:19</p> <p>13 invention, memory modules are generally understood 14:20</p> <p>14 to be ones designed to connect to the primary memory 14:20</p> <p>15 controller for the purpose of the holding general 14:20</p> <p>16 purpose code and data in a computer system. 14:20</p> <p>17 A. If we were talking about them in a general 14:20</p> <p>18 purpose computer context, I think that that would be 14:20</p> <p>19 the most common understanding. 14:20</p> <p>20 Q. Okay. What about in the context of '918? 14:20</p> <p>21 What is that understanding? 14:20</p> <p>22 MR. CHANDLER: Objection. Form. 14:20</p> <p>23 THE WITNESS: I think the '918 is a little 14:21</p> <p>24 bit broader, that it talks about a memory module as 14:21</p> <p>25 kind of being a circuit board that connects to a 14:21</p> <p style="text-align: right;">Page 125</p>

<p>1 host computer that includes memory. 14:21</p> <p>2 BY MS. ZHONG: 14:21</p> <p>3 Q. Where does it say that? 14:21</p> <p>4 A. In the abstract. Let me see if it says it 14:21</p> <p>5 anywhere else. 14:21</p> <p>6 Q. Where in the abstract does it indicate the 14:22</p> <p>7 use of memory module deviates from the common 14:22</p> <p>8 understanding? 14:22</p> <p>9 MR. CHANDLER: Objection. Form. 14:22</p> <p>10 THE WITNESS: Well, it doesn't make any 14:22</p> <p>11 reference there to being a main memory, so it 14:22</p> <p>12 does -- at least in that description, appears to be 14:22</p> <p>13 a little bit broader. Also -- 14:22</p> <p>14 BY MS. ZHONG:</p> <p>15 Q. Well, does it say -- okay, go ahead. 14:22</p> <p>16 A. There's also -- there are also claims on a 14:22</p> <p>17 memory module that, again, don't talk about its 14:22</p> <p>18 functionality or what it needs to connect to. 14:22</p> <p>19 Q. But doesn't that indicate it's just adopting 14:22</p> <p>20 the common understanding of what a memory module is 14:22</p> <p>21 so you don't need to add additional description to 14:22</p> <p>22 limit it? 14:22</p> <p>23 A. Well, as I said, that might be the most 14:22</p> <p>24 common, but not the only understanding of a memory 14:22</p> <p>25 module. Now, there is Figure 12, which shows that 14:23</p> <p style="text-align: right;">Page 126</p>	<p>1 Q. Is a SIMM a memory module? 14:25</p> <p>2 A. I would generally consider a SIMM to be a 14:25</p> <p>3 memory module. 14:26</p> <p>4 Q. And SIMM does not adopt the non-DIMM form 14:26</p> <p>5 factor; right?</p> <p>6 MR. CHANDLER: Objection to form. 14:26</p> <p>7 MS. ZHONG: Let me just withdraw. 14:26</p> <p>8 BY MS. ZHONG: 14:26</p> <p>9 Q. So SIMM, S-I-M-M, does not have the DIMM 14:26</p> <p>10 form factor; correct? 14:26</p> <p>11 A. I think that's correct. 14:26</p> <p>12 MS. ZHONG: For Janis, S-I-M needs to have 14:26</p> <p>13 two Ms, not a single M. 14:26</p> <p>14 DEPOSITION REPORTER: Thank you. It was in</p> <p>15 my dictionary from some other case. 14:27</p> <p>16 BY MS. ZHONG: 14:27</p> <p>17 Q. Can you take a look at Figure 4 of Harris. 14:27</p> <p>18 A. Okay. 14:27</p> <p>19 Q. Does Figure 4 show the power path or voltage 14:27</p> <p>20 path? 14:27</p> <p>21 A. No. I think Figure 4 is a higher level 14:27</p> <p>22 block diagram. 14:27</p> <p>23 Q. What is a "link 411"? 14:27</p> <p>24 A. Sorry. One more time. 14:28</p> <p>25 Q. What is "link 411"? 14:28</p> <p style="text-align: right;">Page 128</p>
<p>1 it plugs into a standard DIMM interface, which would 14:23</p> <p>2 indicate that at least that embodiment is intended 14:23</p> <p>3 to be DIMM compatible. 14:23</p> <p>4 Q. Okay. 14:23</p> <p>5 A. Although it does also say in column 13 that 14:23</p> <p>6 the DIMM form factor is only illustrative. 14:23</p> <p>7 Q. Okay. So that could just mean that the 14:23</p> <p>8 specific DIMM form factors are illustrated; right? 14:23</p> <p>9 Just like in Harris, it had a different DIMM form 14:23</p> <p>10 factor? 14:23</p> <p>11 A. Yeah. It doesn't refer to a different DIMM 14:23</p> <p>12 structure. It just says memory systems using other 14:23</p> <p>13 form factors are contemplated as well. 14:23</p> <p>14 Q. Okay. And do the claims say -- to the 14:23</p> <p>15 extent you are correct that they include non-memory 14:24</p> <p>16 module embodiments, do the claims say that they are 14:24</p> <p>17 directed to those non-memory module embodiments? 14:24</p> <p>18 MR. CHANDLER: Objection. Form. 14:24</p> <p>19 THE WITNESS: I don't think I ever said that 14:24</p> <p>20 there -- includes non-memory module embodiments. I 14:24</p> <p>21 think what I said -- 14:24</p> <p>22 BY MS. ZHONG:</p> <p>23 Q. Okay.</p> <p>24 A. -- is I don't think the claims are limited 14:24</p> <p>25 to main memory. 14:24</p> <p style="text-align: right;">Page 127</p>	<p>1 A. It's a memory link. 14:28</p> <p>2 Q. And what is your understanding of what a 14:28</p> <p>3 memory link is? 14:28</p> <p>4 A. I think it's whatever connection is used 14:28</p> <p>5 between the memory controller and the memory 14:28</p> <p>6 modules. Harris contemplates FB-DIMMs, but he also 14:28</p> <p>7 contemplates RDIMMs and UDIMMs and other kinds of 14:28</p> <p>8 things. 14:28</p> <p>9 Q. You don't contend that power is provided to 14:28</p> <p>10 the memory modules via the memory link, do you? 14:28</p> <p>11 MR. CHANDLER: Objection to form. 14:29</p> <p>12 THE WITNESS: No, it is provided alongside 14:29</p> <p>13 the memory link. 14:29</p> <p>14 BY MS. ZHONG: 14:29</p> <p>15 Q. What do you mean by "alongside"? Is it 14:29</p> <p>16 shown anywhere in Figure 4? 14:29</p> <p>17 A. No. It's shown in Figure 1. 14:29</p> <p>18 Q. Okay. Figure 1 doesn't really show where 14:29</p> <p>19 the DIMM connectors are; right? 14:29</p> <p>20 MR. CHANDLER: Objection. Form. 14:29</p> <p>21 THE WITNESS: Correct. It simply refers us 14:29</p> <p>22 to the variety of known standards. 14:29</p> <p>23 BY MS. ZHONG: 14:29</p> <p>24 Q. Okay. So in Figure 1, there is no expressed 14:29</p> <p>25 disclosure that the external voltage is supplied 14:30</p> <p style="text-align: right;">Page 129</p>